Says Silve Piejko, vice president of Järn-forsen Energi System, a Swedish wood boiler system manufacturer, “Sweden decided to get off fossil fuels a long time ago. Now we have wood-fired district heating everywhere.” But, he added, “in Sweden we don’t have any government incentives for biomass energy for schools, municipal buildings, or district energy systems. Incentives aren’t needed. District heating pays off the initial investment in about 15 years.”

The system that serves the Village of Hovmantorp lies within the kommun or municipality of Lessebo in central Sweden, and is one example of the publicly owned district woodchip systems that operate all over this country. Hovmantorp’s modest system is unassuming, very clean, high-tech and low-maintenance. It just works—and it makes a profit, which Swedish law allows municipally owned energy systems to do. The profit comes back to the kommun, to use in any part of municipal operations.

Inside a plain red box of a building, the district heating plant produces up to five MW of thermal energy (17 MMBtu/hour). The plant, commissioned in October 2008 as the heart of Lessebo’s newest municipal heating system, cost 30 million Swedish kronor, ($3.6 million US), a typical cost for a five MW plant.

The plant’s fuel costs are 0.23 SEK per kWh ($8 US per MMBtu). Its heat is sold to local customers at triple that cost: 0.7 SEK per kWh ($25 US per MMBtu). The typical residential customer also pays 49,000 SEK ($6,000 US) to connect to the system.

“I should have bought into a few district energy systems 10 or 15 years ago!” laughs Piejko. “Then I would have had a comfortable retirement.”

A Sophisticated, Full-Cycle System
Lessebo decided in recent years that all municipally owned property should be served by a renewable energy system. “Our municipality has four village centers, and all will be on wood-fired district energy,” says Per-Johan Johansson, operator of the Hovmantorp system. “Three of them have district heating systems now, and another one will start up soon.”

The Hovmantorp district system, including 20 kilometers (12 miles) of heat distribution piping, serves about 200 houses in the village, along with municipal offices, a school, senior housing, a sports/gymnasium center, and several small businesses and light-industrial facilities. The heating plant and distribution network both have capacity for growth, and the municipality has plans to expand its service over time. The distribution pipes run beneath rights of way at the edges of local roads, not under sidewalks, making them relatively easy to install and service.

Swedish law has strict requirements for public district heating systems. Someone must check the plant once each day, and active alarm functions must be in place. If something goes wrong, someone must respond within half an hour. The aim is to guarantee an absolutely...
reliable system. For the same reason, all public district systems must have a backup oil or gas boiler, with full operating capacity. Hovmantorp has an oil boiler.

Yet this municipality has no full-time employees assigned to any of its district heating plants. Four staff members are responsible for overseeing the systems; each has other responsibilities to the kommun.

“I probably spend one-to-two hours a day here at the plant,” says Joahansson, operator of the Hovmantorp plant. “If my cell phone gets an automated alarm message saying there is something wrong with the boiler or the pumps or something, I have to be here in less than 30 minutes.

“We tell the fuel supplier what quality of fuel we require,” he adds. “We have specifications that say the maximum amount of sawdust, the maximum chip size, moisture content range, things like that.” All chips for the Hovmantorp plant are sourced from a sawmill 15 kilometers (10 miles) away, on a 12-month fuel-supply contract. Fuel deliveries are made by double tractor trailers that tilt sideways as their sidewalls open.

“The European Union sets standards for wood boiler safety,” says Piejko—“but each country sets its own standards for efficiency and emissions. Sweden has some of the strongest emissions regulations in Europe. The combustion equipment (at Hovmantorp) is designed so well that we have no trouble meeting the standards.”

Hovmantorp’s plant meets those standards with only a multicyclone particulate-removal system, which is considered a fairly basic form of emission control. The plant has space reserved for a condensing system that would clean its emissions even further.

Sweden’s wood-heating industry has advanced to the point where even ash disposal is handled in technically sophisticated, well-informed ways. There is a widespread network of businesses that collect waste ash from wood energy facilities like those in Lessebo—and a second network of businesses redistribute the ash into Sweden’s forestland, so the nutrients that come out with the harvested trees find their way back into the forest ecosystem.

Overall, the impacts of Sweden’s widespread investment in biomass energy may best be expressed in an anecdote. Karin Haara, executive director of SVEBIO, a Swedish biomass district-energy trade organization, recently hosted a trade mission from China, visiting Sweden to see biomass energy at work. The delegation visited dozens of systems around the country.

“At the end,” Haara relates, “they said, ‘This is very impressive—but you’re a wealthy country, and we are poor. We can’t afford this.’

“I said, ‘We’re a wealthy country because we did this, 20 years ago.’”

This case studies series was made possible by a generous grant from the US Endowment for Forestry and Communities and through the support of the US Department of Energy.

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